Name: Date:

Polynomial Factoring solution (version 1)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 10x + 37 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-10) \pm \sqrt{(-10)^2 - 4(1)(37)}}{2(1)}$$

$$x = \frac{-(-10) \pm \sqrt{100 - 148}}{2(1)}$$

$$x = \frac{10 \pm \sqrt{-48}}{2}$$

$$x = \frac{10 \pm \sqrt{-16 \cdot 3}}{2}$$

$$x = \frac{10 \pm 4\sqrt{3}\,i}{2}$$

$$x = 5 \pm 2\sqrt{3}\,i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-4 + 9i$ and $2 + 6i$ in standard form $(a + bi)$.**

Solution

$$(-4 + 9i) \cdot (2 + 6i)$$

$$-8 - 24i + 18i + 54i^2$$

$$-8 - 24i + 18i - 54$$

$$-8 - 54 - 24i + 18i$$

$$-62 - 6i$$

Polynomial Factoring solution (version 1)

3. **Write function $f(x) = x^3 - 8x^2 + 19x - 12$ in factored form. I'll give you a hint: one factor is $(x - 4)$.**

Solution

	1	-8	19	-12
4		4	-16	12
	1	-4	3	0

$$f(x) = (x-4)(x^2 - 4x + 3)$$

$$f(x) = (x-4)(x-1)(x-3)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x+4)^2 \cdot (x-1) \cdot (x-6)$$

Sketch a graph of polynomial $y = p(x)$.